

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A process analytic system comprising:
  - a device for sensing a concentration of a combustible species of interest in an exhaust stream;
  - a controller coupled to the device and configured to receive measurements of the concentration of the combustible species; and
  - a blowback system coupled to the device and the controller, the blowback system being configured to responsively reverse gas flow through the device;wherein the device comprises:
  - a holder;
  - a first RTD disposed in a first protective cover, wherein the first cover is metallic and is mounted to the holder;
  - a second RTD disposed in a second protective cover, wherein the second cover is metallic and is mounted to the holder; andwherein the first cover comprises a catalyst thereon which has a higher catalytic activity to the species of interest than the second cover.
2. (Original) The device of claim 1 wherein the first cover is formed from a tube.
3. (Original) The device of claim 1 wherein the second cover is formed as a tube.
4. (Previously Presented) The device of claim 1 wherein the catalyst is disposed on the first cover as a film.

5. (Currently amended) The device of claim ~~14~~ wherein the film is a Group VIII catalyst comprises doped lanthanum manganite noble metal catalyst.

6. (Currently amended) The device of claim ~~14~~ wherein the film is constructed from a metal oxide combustion catalyst catalyst comprises doped ceria.

7. (Canceled)

8. (Previously Presented) The device of claim 1 wherein the catalyst comprises perovskite.

9. (Previously Presented) The device of claim 1 wherein the catalyst comprises hopcalite.

10. (Original) The device of claim 1 wherein the second cover is constructed from a catalyst-free stainless steel tube.

11. (Original) The device of claim 1 wherein at least one of the first and second cover is joined to the holder using thermally insulative material.

12. (Original) The device of claim 11 wherein the thermally insulative material is selected from the group of ceramic cement, adhesive, and high-temperature epoxy.

13. (Currently Amended) A process analytic system comprising:  
a device configured for determining a concentration of a  
combustible species of interest in an exhaust stream;  
a controller coupled to the device and configured to receive  
measurements of the concentration of the combustible  
species; and

a blowback system coupled to the device and the controller,  
the blowback system being configured to responsively  
reverse gas flow through the device;

wherein the device comprises:

a solid electrolyte;

a reference electrode that is inactive to the  
combustion reaction; and

a working electrode that is constructed using doped  
ceriaeatalytically ~~active to the combustion~~  
~~reaction~~, wherein the working electrode and the  
reference electrode are coupled to the solid  
electrolyte ~~and are adapted for resistance to~~  
~~elevated temperature and to the presence of~~  
~~sulfur.~~

14. (Original) The device of claim 13 wherein the reference and  
working electrodes are couplable to the exhaust stream.

15. (Original) The device of claim 13 wherein the solid  
electrolyte is selected from the group consisting of doped  
zirconia, ceria, and bismuth oxide.

16. (Original) The device of claim 13 wherein the reference  
electrode is constructed from gold.

17. (Original) The device of claim 13 wherein the reference  
electrode is constructed from doped lanthanoid chromite.

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Currently amended) A ~~process analytic system comprising:~~  
a solid state device for determining the concentration of oxygen  
in a gas phase: ~~,,~~

~~a controller coupled to the solid state device and  
configured to receive measurements of the concentration  
of the oxygen; and~~

~~a blowback system coupled to the solid state device and the  
controller, the blowback system being configured to  
responsively reverse gas flow through the solid state  
device;~~

~~wherein the solid state device comprises~~ comprising:

a solid electrolyte;

a reference electrode coupled to the solid electrolyte;  
and

a working electrode including ~~constructed from~~ a mixed  
ion/electron conductor chosen from the ceria-  
containing fluoride group of material ~~se~~ conducting  
oxide, wherein the working electrode is coupled to  
the solid electrolyte ~~and is adapted for~~  
~~resistance to ambient sulfur and to elevated~~  
temperature.

24. (Original) The device of claim 23 wherein the solid  
electrolyte is selected from the group consisting of doped  
zirconia and ceria.

25. (Original) The device of claim 23 wherein the reference electrode is constructed from the group consisting of platinum, a metal oxide electrode, and a mixed conducting electrode.

26. (Original) The device of claim 25 wherein the metal oxide electrode includes perovskite structure.

27. (Original) The device of claim 25 wherein the metal oxide electrode includes oxide with fluorite structure.

28. (Original) The device of claim 23 wherein the working electrode is constructed from ceria or its solid solution doped with at least one mixed valency element.

29. (Original) The device of claim 28 wherein the mixed valency element is one of terbium and praseodymium.

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)